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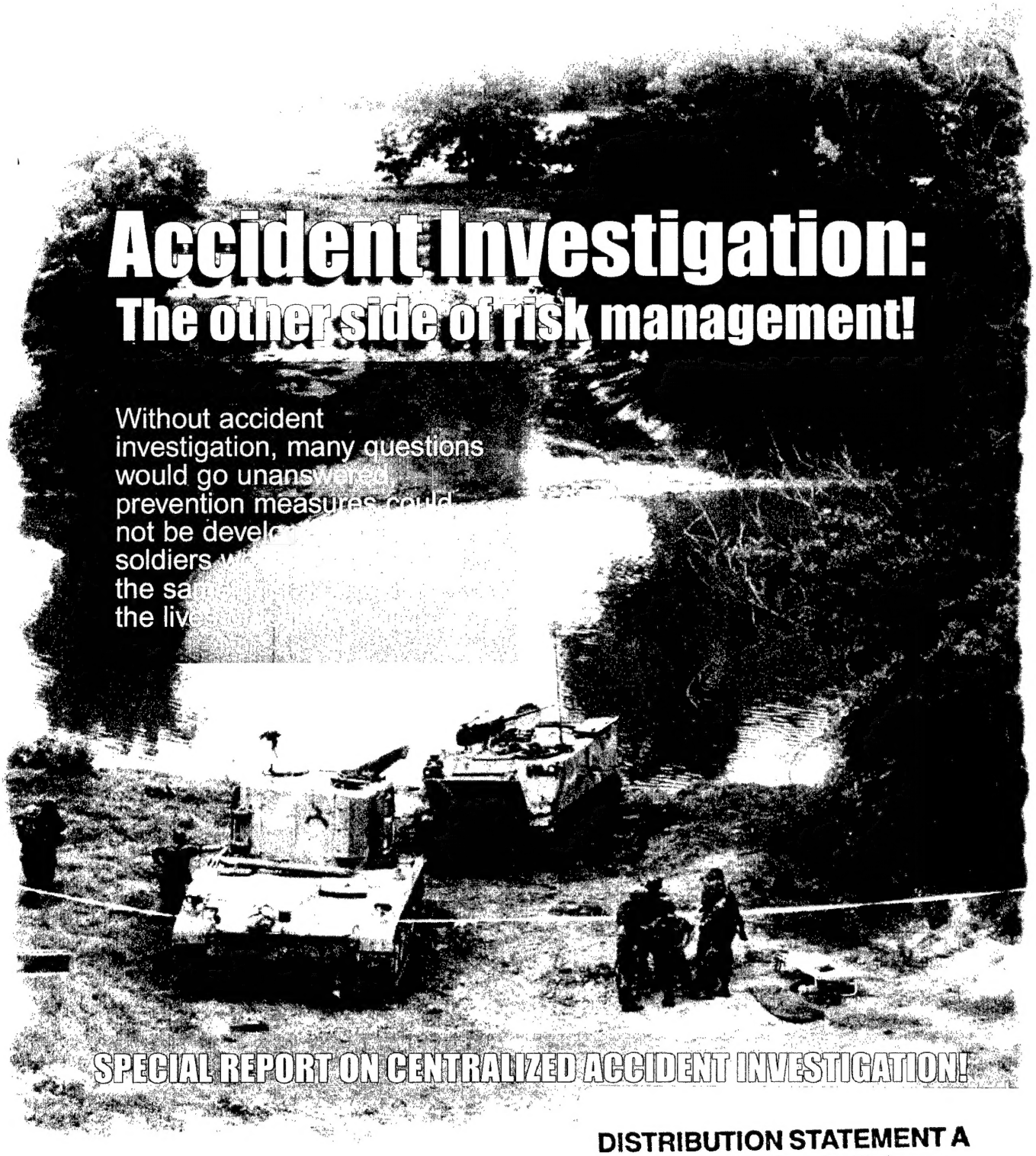

Accident Investigation:
The other side of risk management!

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SPECIAL REPORT ON CENTRALIZED ACCIDENT INVESTIGATION!

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The Official Safety Magazine for Army Ground Risk-Management

Accident Investigation: The Other Side of Risk Management

When an accident occurs, determining the circumstances surrounding the accident and finding answers becomes a driving force. With the information obtained from accident investigations, safety programs and prevention measures are developed to protect and safeguard our soldiers and equipment in similar future accidents.

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A Safety Officer's Perspective

The worst has happened: This Safety Officer's unit has just had a Class A aviation accident. Read and find out what you could face someday at an accident site.

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Securing the Accident Scene

An Army Safety Center Accident Board Recorder provides important information on securing an accident scene.

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Investigators' Forum

A driver was killed and his vehicle commander injured when their HMMWV ran off a tank trail and overturned. The driver WAS wearing his seatbelt, but he was not wearing it correctly. Excess speed, driver inattention, and driver inexperience were also factors in this accident.

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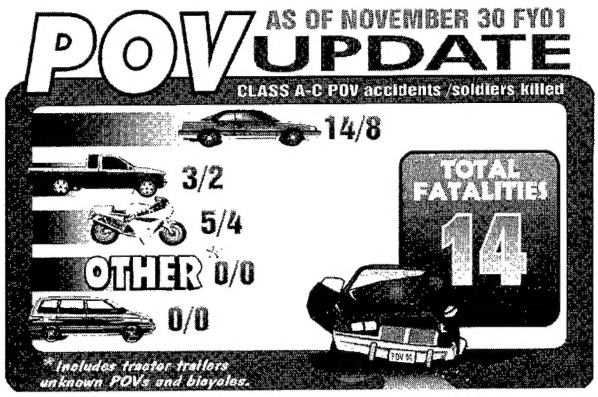

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Gene M. LaCoste
Brigadier General, U.S. Army
Commanding Officer

Accident Investigation: The Other Side of Risk Management

Without accident investigation, many questions would go unanswered, prevention measures could not be developed, and soldiers would be left to make the same mistakes that often took the lives of fellow soldiers.

Obviously, the most asked question following an accident is "What happened?" Was it caused by materiel failure? Were environmental factors responsible for the accident? Or was it human error? But, we also must know "why it happened." If a weakness in leadership, training, standards, or support functions led to the tragedy, then we must find that weakness.

When an accident occurs, determining the circumstances surrounding the accident and finding answers to these questions becomes a driving force. Following an accident, the very reliability of the equipment—whether it is track, wheeled, or aircraft—is sometimes questioned. If a mechanical malfunction caused the accident, the possibility exists that the same malfunction could strike again. Although mechanical malfunctions do occur, the majority of accidents result from human error. And we need to know why the errors occurred.

Before prevention measures can be developed, we must determine what happened, what caused it to happen, and why specific errors occurred. If cause factors can be determined, then the question becomes "What can we do to prevent this kind of accident from happening again?"

The Army Safety Center has been seeking answers to these questions and developing preventive measures since April 1978, when the Army conducted their first centralized accident investigation (CAI). And CAI has proven so effective that it is still the process we use today to find answers.

The quest for answers

The Safety Center investigates virtually all Class A and selected Class B accidents Armywide. Even as this issue of *Countermeasure* is being prepared, accident investigators are diligently searching for answers, trying to determine what happened and why. But it will be some time before those answers are known.

Sometimes in spite of all the enormous efforts of the CAI team and the specialists who are called in to assist with the analysis of what little evidence is available, definitive answers cannot be found. In a few cases, suspected scenarios are the only answers that can be determined. All accidents are tragic, but these are especially so because unanswered questions limit our ability to develop prevention measures.

However, in most cases, the accident investigation process yields answers. Based upon those answers, the readiness shortcomings—whether they be individual, leader, training, standards, or support failures (and often combinations of failures)—are identified.

The focus can then be diverted to finding ways to enhance the safety of our soldiers. Sometimes the fix is at unit level, such as improving unit training or enforcing standards. Other times, the fix is at Army level, such as improving school training or changing equipment design or operating procedures.

The important thing is that it gets fixed. That's why accident investigation is so important—it's the other side of risk management. With the information obtained from accident investigations, safety programs and prevention measures can be developed to protect and safeguard our resources—whether it is costly equipment or priceless lives—in similar future accidents.

(Editor's note: Although the following article specifically addresses an aviation accident, ground personnel can learn from this also.)

A Safety Officer's Perspective

The worst has happened: My unit has had a Class A accident and I'm the Safety Officer. I've had the training, I'm responsible, and I've got to get moving.

These are just a few of the many thoughts that raced through my mind as I stood there fighting against the numbing effects of shock. I had arrived on the scene of a safety officer's worst nightmare. I saw the burning, twisted wreckage of one of our Army aircraft where it had crashed into two civilian homes, damaging one severely. In addition to the aircraft crew, somewhere in the midst of this wreckage was an unknown number of civilian casualties. And some 200 feet away, still attached to an unopened parachute, my best friend lay dead.

Some 200 feet away, still attached to an unopened parachute, my best friend lay dead.

I was a qualified, school-trained aviation safety officer (ASO) and I was supposed to know what to do; but at that moment, I must have been brain dead. The overwhelming shock had momentarily halted my thinking processes. I needed a 1-2-3 checklist to help me get started without having to think.

Several things came to my rescue. The local fire department was on the scene immediately with the proper equipment to extinguish the fire. As a result of previous safety classes, members of the unit produced engineer tape, ropes, stakes, mauls, and protective equipment they would need to quickly secure the area. With outstanding support from local authorities, the area was quickly cleared of unnecessary people. We then established a site-pass system and traffic control around the area.

By this time, our unit's pre-accident plan was functioning well. The notification process was ongoing, areas of responsibility had been assigned, and things were beginning to work again. Within 15 minutes of the accident, the first of three TV-network crews arrived on the scene. I assigned escorts and allowed one team at a time to do their report and leave the area before allowing another team in.

The pace slowed from panic to frantic as the centralized accident investigation (CAI) team from the Army Safety Center arrived. Believe me, I was more than glad to hand over control of and responsibility for the situation to the investigation team.

From that point on, I acted as coordinator between the CAI team and the unit. I arranged for local investigation board members to supplement the CAI team. And I also took care of other support, such as personnel to search for missing parts of the wreckage, clear away debris, or to crate exhibits for shipment to maintenance facilities or laboratories for further examination and analysis.

After the CAI team arrived, I simply followed their instructions. But during those first few hours after the accident, I was responsible. And I tell you, in those first few minutes, I questioned my own ability to handle the enormous number of details needed to get the situation under control.

School training is necessary and valuable, but no amount of classroom work can fully prepare an ASO to deal with the multitude of details requiring attention following a major accident. It's true that you can't fully comprehend this kind of situation until it actually happens to you. I hope you won't have to gain that experience first-hand, but as an ASO, you must be prepared or at least as prepared as you possibly can be.

Lessons learned

During the past 7 years since I stood there that hot July afternoon looking at the crash site, I've gained a lot more experience in dealing with aircraft accidents as both an ASO and an accident investigator. The following lessons that I've learned might prove helpful to others:

■ Identify, equip, and train an emergency-response team that is able to react on a

moment's notice. These are the people who will go with you to the accident site, and these are the people who should be responsible for having the necessary supplies and equipment to secure the site and preserve the evidence.

■ Ensure that your unit's pre-accident plan is as comprehensive as it can be. Ask others for their ideas about what should be included in the plan. Then select an individual and an alternate to implement the plan. You will be far too busy at the accident site to do this yourself.

■ Plan ahead to ensure that a reliable communications system to your home station or facility is available. Make sure telephones are secure to prevent leaks of premature and inappropriate information.

■ Ensure that local authorities are aware of the special requirements that arise from a military accident that occurs off the military base. A pamphlet on *What to Do and How to Report Military Aircraft Accidents* is an excellent guide you can provide to civil authorities, firefighters, and emergency medical personnel. Copies of the pamphlet can be obtained by writing to Commander, U.S. Army Safety Center, ATTN: CSSC-SM (Ms. Sharrel Forehand), Fort Rucker, AL 36362, or by calling DSN 558-2062 (334-255-2062), or by emailing forehans@safetycenter.army.mil.

■ When an accident occurs off a military base and civilian injuries and property damage occur (such as what happened in my first accident), additional problems and questions for which you will have no answers must be addressed. Therefore, it is vital that you have legal and logistics personnel promptly address civilian questions, take care of medical expenses, and provide temporary lodging for those who may be displaced from their homes.

■ Officials from the Public Affairs Office (PAO) are the only ones who should release information to the news media. However, there will be times when PAO personnel are not readily available, and the media will be all over you. Remember, you cannot legally keep them from an accident site once the firefighting and crash rescue efforts are completed. Work with them. But you must also remember that you can only give generic statements, such as "The accident is under investigation. No details are available at this time. The PAO will issue a statement as soon as details become available."

■ Consider issuing small index cards to all of your aircrewmembers and have them list who should be notified in case of their death. Also have them include whom they would like to make the notification and a last, short message if desired. This will serve two purposes. First, it will serve as a solemn reminder to all aircrewmembers of the inherent danger lurking in the environment in which they operate daily and possibly make them more safety conscious. Secondly, providing the requested information will ensure that a person of their choice—a close friend, their company commander, their chaplain—will be the one to tell their family about the tragedy should that dreadful notification process become necessary.

It's not an easy job to put an accident plan in motion. But as the unit ASO, it's your responsibility to see that it is done effectively and efficiently. You're in charge until the accident investigation team arrives. The first thing you have to do is fight the shock and panic, and quickly get your thinking processes back in action. Remember the lessons you've been taught in formal schools and those you've learned from others who have had similar tasks to do.

As unpleasant and demanding as this part of your job will be, the actions you take in handling the situation until the CAI team arrives will make it that much easier for the investigators to come in and begin their analysis. The sooner questions can be answered, the sooner it can be determined what can be done to prevent a similar accident from happening. And that equates to saving lives and equipment.

Accept the challenge to the best of your ability; prepare yourself now for what you could face someday at an accident site—it's your responsibility.

—Adapted from Flightfax

Accident Reporting Key to Army Safety

Accidents happen according to the old, time-honored saying. But, when they happen in the Army, an investigation of some sort is sure to follow.

All accidents are reportable at the local level—that means any unplanned event that caused property damage, injury, death, or occupational illness. Even if no one was hurt, the accident must be reported if Army equipment is damaged in any way.

The investigation includes a procedure almost everyone in the Army is familiar with—filling out DA Form 285, the *U.S. Army Accident Report*. The DA Form 285 is the catalyst for the recording of Army ground accident investigations. The form summarizes the basics of the accident—the who, what, when, where, and how the accident happened. It references resulting personal injuries as well as property damage. It also addresses the causes of the accident and corrective action that should be taken.

Command responsibility

The commander or supervisor over the operation, equipment, or persons involved is responsible for the notification of an accident. The local safety officer will normally determine the classification and board requirements and initiate action to have the accident investigated. He then forwards the report to the Safety Center by mail, fax, phone, or email. (See box on next page for notification and reporting requirements and suspenses.)

The Safety Center receives and processes a wide array of accident information daily. The Army uses this data—and that means all the way up to the Chief of Staff and Secretary of the Army—to generate countermeasure programs and reduce accidents and their resulting high cost. The accident data serves as the building block for Army safety. However, the building block is only as good as the information provided. If you don't report an accident, we don't know there's a problem. And if you don't complete the paperwork correctly, it takes us longer to pinpoint the problem.

Analyzing the information

So even though accident reports are generated locally, they have Armywide significance. Thousands of DA Forms 285 come through the Safety Center each year, and when they get here, they aren't just filed away. They are reviewed, edited, and processed for accident prevention purposes.

Safety technicians process the information into a database. Quality-control experts evaluate the information for accuracy and completeness. If a discrepancy is found, the Safety Center contacts the submitter for clarification or correction.

Statisticians then look at the information for trends. This information can provide leaders with a quick "snapshot" of where their units are heading in the accident arena, or where and when most accidents happen.

After the data has been categorized, it is distributed to safety specialists who monitor the types of accidents that occur within their field or specialty. These specialists track accident data by branch and deal directly with field units in an effort to identify accident-causing hazards. Field units may also call safety specialists directly to discuss problems.

Getting the word out

As hazards are identified, safety personnel determine the urgency for getting the information to the field. The most urgent messages go out within 24 hours on a Safety Alert Notification and publicized on the Safety Center web site: **http://safety.army.mil**. Besides message traffic, the Safety Center has two publications that get the word out to the field: *Countermeasure*, the ground safety publication and *Flightfax*, the aviation safety publication. Publicizing hazards in this way gives soldiers an idea of safety problems that are actually occurring in the field.

Reporting accidents improves Army safety. In addition, accident reports will provide

installation and Army leaders with a more complete picture of unit readiness, training deficiencies, and health hazards in the workplace. Also, equipment deficiencies may be identified at an early stage, passed along to the manufacturers, and corrected before soldiers get hurt or killed and equipment damaged.

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Ground Accidents Notification and Reporting Requirements & Suspenses[3]

	Peacetime			Combat[2]	
Accident Class	Telephonic Notification Worksheet	AGAR	DA Form 285	Telephonic Notification Worksheet	AGAR only By any means possible (Message, Electronic, FAX, Phone, Hand Carry, Mail)
On-Duty					
A	Immediately[1]	Not required	IAI/CAI-90 days	Immediately[1]	As time permits (Not to exceed 30 days)
B	Immediately[1]	Not required	IAI/CAI-90 days	Immediately[1]	As time permits (Not to exceed 30 days)
C	Not required	Within 30 days	Not required	Not required	As time permits (Not to exceed 30 days)
D	Not required	Within 30 days	Not required	Not required	As time permits (Not to exceed 30 days)
Off-Duty					
A	Immediately[1]	Within 30 days	Not required	Immediately[1]	As time permits (Not to exceed 30 days)
B	Immediately[1]	Within 30 days	Not required	Immediately[1]	As time permits (Not to exceed 30 days)
C	Not required	Within 30 days	Not required	Not required	As time permits (Not to exceed 30 days)
D	Not required	Within 30 days	Not required	Not required	As time permits (Not to exceed 30 days)

Notes:

[1] USASC must be notified IMMEDIATELY by phone at DSN 558-2660/2539/3410 (334-255-2660/2539/3410) or notify USASC Safety Rep forward (during combat).

[2] ONLY when the senior tactical commander determines that the situation, conditions, and/or time does not permit normal peacetime investigating and reporting.

[3] Army civilian injury only accidents should be reported on appropriate Department of Labor forms IAW this regulation.

—Excerpt from AR 385-40

Securing the Accident Scene

Accident: An unplanned event that causes personal injury, illness, or property damage. When an accident happens, it creates confusion in the unit; a mission must stop; a cease-fire must be called; a unit must re-organize.

These activities, generated by the unfortunate event, create an atmosphere where soldiers and leaders lose focus momentarily and fail to follow pre-accident plans or other local Standing Operating Procedures (SOP). Immediately after the accident, crucial evidence of the accident scene must be preserved for further analysis. Therefore, it is imperative that proper procedures are followed to ensure no tampering of evidence occurs.

Generally, the classification of an accident will determine whether a Centralized Accident Investigation (CAI) from the Army Safety Center will deploy to investigate an accident. However, in many cases, a local Installation Accident Investigation (IAI) will be responsible for the conduct of an investigation. Regardless of who investigates an accident, there are certain procedures that must be followed to ensure the investigating team has access to the most accurate information and evidence of an accident scene.

Installation regulations, local SOPs, and pre-accident plans should provide specific details to accomplish the reporting of accidents and subsequently the determination of who will investigate the accident. As stated before, regardless of who investigates, the unit safety officer and unit members must know how to preserve and secure the accident scene and provide general guidance to local authorities.

Use AR 385-40, paragraph 4-5, as a guide on accident scene preservation and observe the following procedures:

■ When the situation permits preservation of the accident scene, only those actions necessary for rescue or recovery of victims and the initial on-site investigation by MP/CID will be allowed. If the situation does not permit preservation of the accident scene, MP/CID will remove all items of evidence needed for the investigation.

■ The unit safety officer will coordinate with the installation safety office in conjunction with local authorities to secure the physical evidence collected. Additionally, the custodian will ensure the evidence is secured and readily available to the investigating board. The board will release all evidence to the unit once it is analyzed and no longer needed for the investigation. Until that time, the accident scene and all equipment associated with it are under the control of the investigating board.

■ When possible, photographs of the location of victims should be made before the victims are moved. Additional photographs of the accident site and a preliminary sketch should be done making sure the evidence is not moved or removed. Remember, the investigating board will conduct a thorough analysis of the site. Do avoid contaminating any wreckage, damage, and ground markings while doing your preliminary documentation. Once completed, secure the area and await the investigating board's arrival.

■ Access will be restricted to those commanders and personnel directly involved in investigating the accident. Do not allow anyone not in an investigating role to disturb

the site. Once the classification of an accident is determined, an investigating board will be appointed. They will be in charge of the accident scene; therefore, no one else is authorized to walk through, move, remove, or do anything else to the accident scene except to provide security for its perimeter.

Remember, the accident scene belongs to the investigating board not to the MP/CID, unit commander, etc. Safety officers must ensure this crucial issue is addressed and coordinated in their pre-accident plan with the appropriate installation agencies. Note: If there is evidence of criminal activity in the initial accident analysis, then it is no longer an accident. Refer to AR 385-40, paragraph 4-9, for additional information.

■ Before arrival of the accident investigation board at the accident site, MP/CID personnel should remove only those items of evidence that would be destroyed by time or the elements. Safety officers in conjunction with local authorities should determine what items will be affected by climatic conditions and avoid removing those that may provide crucial information as to the cause of the accident. As a general rule, do not move anything until the investigating board is on scene to analyze the evidence. Additional procedures for accident scene preservation are contained in DA Pam 385-40, *Army Accident Investigation and Reporting.*

These guidelines will assist you in preserving and documenting the accident scene and will ensure the investigation process begins with accurate and timely information. Remember, the guidelines are not all inclusive. Coordinate with the installation safety office and other local agencies to ensure your pre-accident plan reflects any additional information that will help you and your unit understand the importance of a secure and undisturbed accident scene. Make sure you do it right...the first time.

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When The Mission Becomes Safety

During training exercises, units attempt to simulate as close as possible the environment they will encounter in the battlefield. Strong emphasis is placed on ensuring that conditions simulate those during combat. The tough and realistic requirements of training exercises ensure the Army is prepared to face any conflict with ready-to-fight soldiers and equipment. It is this level of preparedness that will ensure success in the battlefield.

As a result, during training preparation and execution, the soldier is highly focused on mission accomplishment. Many elements are involved in the planning stages that help ensure the executable part of the mission is performed effectively. A dilemma arises when mission accomplishment is hampered by an event that prevents the safe execution of the mission. What is the individual to do? Follow the plan and continue to train as you fight? Stop to correct the deficiency? Should the leader/soldier make the unforeseen event the current mission? Has safety become the mission? These are some questions soldiers face during training when dealing with an unsafe event. The approach we use to resolve the event will in effect determine if the mission is or isn't accomplished successfully.

Safe mission accomplishment during training involves effective risk management. As part of the planning process, it should be addressed in the operations plan and order development. During the execution phase, risk management must be promulgated in safety briefings, as part of train-up exercises, and as

the training evolves.

Safety is an intricate part of mission accomplishment. Without a safe attitude to training, the unit may face a situation where an accident happens, a vehicle is destroyed, or other equipment key to mission success is no longer available to accomplish the mission. Without that key element—individual or equipment—the mission will not be accomplished successfully.

When a safety issue arises that would compromise the safe conduct of a mission, it inherently becomes the new mission. Addressing the unsafe act is now the mission. As part of the planning process, the leader must program training time to address mission safety concerns and train soldiers to integrate the risk management process into their individual missions. Leaders should use thoughtful and innovative approaches to train soldiers on the five steps of the risk management model.

A recent accident investigation demonstrates the importance of understanding this concept. During a training exercise, a vehicle driver reported to his vehicle commander (VC) that a warning light had come on in the driver's panel indicating a problem with the engine temperature. The VC acknowledged the information and elected to continue the mission. As the vehicle proceeded on the mission, another warning light came on indicating an even more serious situation. Still, the VC elected to continue the mission. Sometime afterward, the vehicle stopped and while scanning the area, the VC noticed that the vehicle engine was on fire. As a result of these actions, the engine was destroyed, the crew of the vehicle had to exchange the vehicle, time was lost, the unit did not meet their objective as intended, and the focus of the training event changed.

After interviewing the VC as to why he did not stop when the warning light came on, he responded that this condition occasionally occurred and the unit was to train as if in combat...and if in combat, he would have done the same thing.

Not recognizing the safety issues involved in his actions, the VC placed the crew of the vehicle at risk of serious injury and also the vehicle itself. Without the vehicle, the unit had to continue the mission knowing the possibility of success was now highly compromised. The rationale of the train-as-you-fight guidance had been lost in the fact that when a safety issue comes into play, the resolution of that issue becomes the mission.

Leaders must integrate risk management into all phases of training and seek innovative approaches such as "what if scenarios" to challenge unit members to react to unforeseen circumstances. The previous example is just one of many situations that soldiers face when engaged in demanding training environments. Regardless of the training situation, leaders and soldiers must also understand that training exercises are just that—training. Under no circumstances should safety be overlooked to achieve a training objective. It is the safety-oriented process that will assist the unit in achieving the mission successfully.

Another accident demonstrates the importance of maintaining focus on the objective safely. The unit was engaged in a challenging river crossing operation when the decision was made to float downstream. Even though current readings had not taken place, a safety boat was not on standby, and an exercise participant was not wearing a flotation device, the squad decided to proceed with the mission anyway.

Unfortunately, the river's current was strong enough that it pulled all the team's elements under an anchored barge. Some of the team members survived, but two of them did not. Again, the mission was part of a training exercise.

Now we can look back and think of all actions we could have taken to prevent this unfortunate accident; however, now it is too late for the unfortunate participants. Again, leaders must re-emphasize that when encountering an unsafe situation, the mission must now become safety.

Refer to FM 100-14, Risk Management, for an in-depth explanation of the risk management process. Remember that nothing beats a level head and common sense. If a situation creates doubt as to its degree of safety, stop...think...and apply the risk management process. Ask yourself the ultimate question, "Is this safe?" If not, then make safety the mission.

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We Need Your Lessons Learned

Safety Professionals, we need your help! As you identify lessons learned, please use one of the media avenues described below to get the information out to the field. It may be the difference between a life saved and one lost. Your lessons learned could keep people from making mistakes that someone else has already made. Your input is vital to an effective accident prevention program.

Tools available to help you get the word out

■ **RMIS**. The Risk Management Information System is a powerful risk management and research tool aimed at helping meet DoD and Army goals for accident prevention. It is a worldwide Internet-based risk management tool designed to help leaders and their staffs make informed decisions to do tough missions safely. The web site for RMIS is **http://rmis.army.mil**. Please send your lessons learned to Dwight Lindsey, RMIS Administrator, lindseyd@safetycenter.army.mil.

■ **ASO/CP12 LISTSERVERs**. This is a quick way to get information out to the field. Send email to Dr. Brenda Miller [millerb@safetycenter.army.mil], CW3(P) Darrel Smith [smithd@safetycenter.army.mil], or Mr. Lee Helbig [helbigc@safetycenter.army.mil] with the information you want disseminated. If you are a subscriber to these listservers, you can post the information directly.

■ ***Countermeasure***. This publication is focused on "Ground" accident prevention—to include Army motor vehicles (track & wheeled), POV, munitions, fire protection, seasonal articles, recreation and athletics (all Army operations other than aviation). *Countermeasure* is published monthly with a circulation of 35,000 copies and is also posted to the Army Safety Center web site. Distributed down to unit level, its primary audience includes first-line leaders of soldiers and its secondary audience is commanders. Send your lessons learned or ground-related articles to Ms. Paula Allman, Managing Editor, allmanp@safetycenter.army.mil or countermeasure@safetycenter.army.mil.

■ ***Flightfax***. This publication is designed for "Aviation" accident prevention. *Flightfax* is published monthly with a circulation of 18,000 copies and is also posted to the Safety Center web site. Distributed down to unit level, its primary audience is aviation safety officers and operational pilots, and its secondary audience is aviation commanders and maintenance personnel. Send your lessons learned or articles to Ms. Judy Wilson, Managing Editor, [wilsonj@safetycenter.army.mil] or flightfax@safetycenter.army.mil.

■ **Center for Army Lessons Learned (CALL)**. CALL provides a forum for lessons learned. The CALL publications are distributed in both paper and electronic copy. The intent is to share knowledge, support discussion, and impart lessons and information in an expeditious manner. The CALL publication is not a doctrinal product and is not intended to serve as a program to guide the conduct of operations and training. The information and lessons are not staffed, but are the perceptions of those individuals involved in military exercises, activities and real-world events. If you have articles and lessons of interest to the Total Force, please contact the Managing Editor, Dr. Lon R. Seglie, segliel@leavenworth.army.mil. You can visit the CALL website at **http://call.army.mil**. If possible, articles should be submitted in either Word Perfect or WORD format. Graphs, slides and clip art should be submitted separately from the document in either ppt, pcx or wpg format.

POC: Dr. Brenda Miller, USASC Chief, Training and Education Division, DSN 558-3553 (334-255-3553)

Investigators' Forum

Written by accident investigators to provide major lessons learned from recent centralized accident investigations.

A Tragedy Repeated

A unit was conducting tactical operations as part of a planned training exercise. The plan called for each company to conduct continuous tactical operations against an opposing force (OPFOR). These operations were to last for three days. The accident occurred on the final day of operations.

By 1030 that morning, the soldiers from the unit completed an after-action review (AAR) and were conducting a police call of the training area. One of the vehicle commanders (VCs) directed his driver, who had only 2 months of driving experience, to take a high-mobility multipurpose wheeled vehicle (HMMWV) and return to the battle position to check for any equipment and pick up trash. The route from the battle position was along a gravel-covered tank trail marked by numerous curves and hills.

At approximately 1130, the vehicle entered an extremely sharp right curve at an undetermined rate of speed. This curve was at the end of a gradual downward slope. As the vehicle maneuvered through this portion of the tank trail, the VC directed the driver to slow the vehicle down because he felt that it was moving too fast for the conditions.

As the vehicle entered the curve, the VC noticed the driver bending forward and reaching down to the floorboard with his right hand. At this time, the VC yelled out to the driver that he was about to run off the road.

What went wrong?

As the vehicle entered the curve, the VC noticed the driver bending forward and reaching down to the floorboard with his right hand. At this time, the VC yelled out to the driver that he was about to run off the road.

Immediately following this, the vehicle ran off the left side of the tank trail. The tank trail dropped off approximately 15 degrees at this point. As the vehicle's right rear tire left the tank trail, the vehicle began to slide down the embankment. As this happened, the driver turned the wheels into the curve causing the rear of the vehicle to continue to slide to the left. The VC braced himself in the right front seat of the vehicle. The vehicle then abruptly overturned. The driver was thrown out and pinned beneath the vehicle. The driver was wearing his seatbelt, however he had not removed the slack from the retractor to tighten it properly. The VC sustained minor injuries.

Lessons learned

When the VC noticed the driver's inattention to the road, he should have immediately made an on-the-spot correction. Army Regulation 600-55 states that part of the vehicle commander's responsibilities are to ensure the driver complies with road signs and posted speed limits, and adjusts as dictated by weather, traffic, and road conditions. Further, he had a responsibility to ensure the proper wear of the driver's seatbelt restraint device.

Several months prior to the accident, the unit commander decided to remove the front doors from the HMMWV. While the removal of the doors did not cause the accident, it did add to the severity of the injuries sustained in the accident. The driver was thrown out of the vehicle and ultimately pinned beneath the vehicle.

Alterations to a vehicle's design often create new hazards, which must be addressed during the risk

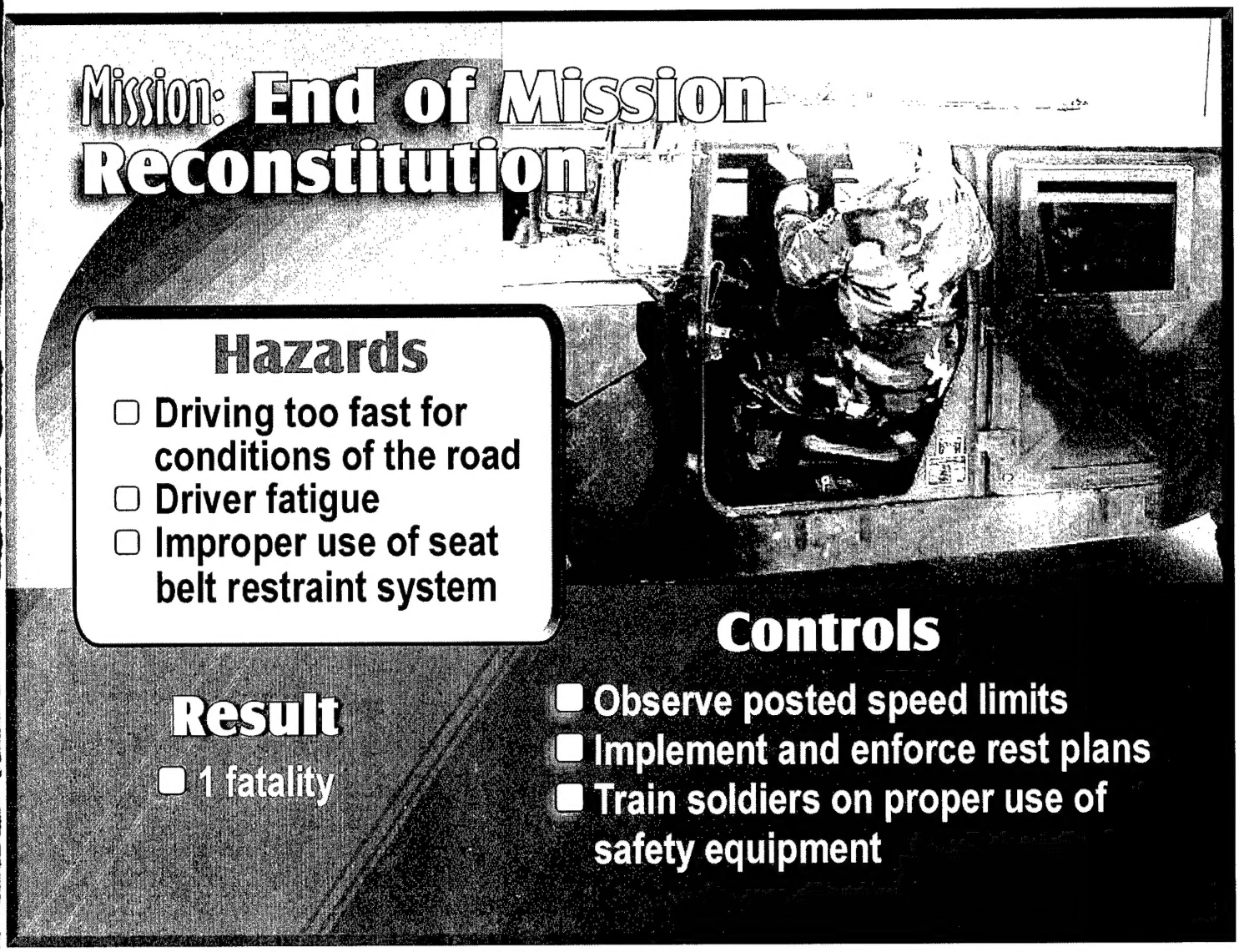
management process. Commanders must examine the benefits derived by design changes versus additional hazards caused by these changes.

Finally, what makes this accident especially tragic is that the driver of the vehicle WAS wearing his seatbelt during the course of the accident. Unfortunately, he was not wearing it correctly. This vehicle utilized a two-point seatbelt restraint system common to older versions of the HMMWV. While the seatbelt is retractable, it does not contain an inertial stopping device that most civilian vehicles have as standard equipment. This means that the user must remove all slack from the retractor and tighten the seatbelt snug across the body. Failure to do so prevents the seatbelt from performing as designed and endangers the user. Instructions on proper wear of the seatbelt and warnings about the hazards associated with this seatbelt are posted in TM 9-2320-280-10.

Summary

Historically, Army motor vehicle accidents occur because of three factors: excess speed for the conditions, driver inattention, and driver inexperience. In this case, these factors also applied. Commanders must be vigilant in their efforts to ensure proper driver selection and training procedures are followed. They must also ensure that VCs are trained on their duties. Finally, commanders must rigidly enforce standards for the safe operation of Army equipment. Our soldier's lives depend on it!

POC: Ground Systems and Accident Investigation Division, DSN 558-9525 (334-255-9525)



Investigators' Forum

Written by accident investigators to provide major lessons learned from recent centralized accident investigations.

A Turn for the Worse

An M1A1 tank crew conducting annual qualification gunnery had just finished Table VIIIb (night) and was preparing for a re-run of Table VIIIa (day). The crew needed one more qualified engagement in order to receive enough points for a "Q2" rating.

They started their day conducting personal hygiene and eating breakfast. Normally, they would conduct preventive maintenance checks and services (PMCS) on the tank; but the day prior, the crew had "walked the track" and replaced six grease fittings during their inspection. They felt comfortable that the vehicle was in good working order. The only maintenance that was conducted consisted of replacing one of the driver's periscopes because of the glare created by a scratched lens.

Around 0600, they received their range safety briefing and moved to the boresight line to re-verify their boresight. When the crew completed the weapons boresighting, they repositioned the tank to an assembly area and waited for their turn to move down range.

About five minutes later, the TC received the mission to move down range and occupy Battle Position one (BP1). The driver made a left turn onto the service lane and accelerated toward Lane Delta. The turn pad at the intersection of the service road and Lane Delta was spotted with gravel. The driver had to make a 90-degree right hand turn onto Lane Delta and then proceed to BP1. As the driver maneuvered the tank into the turn, the left track skidded on the loose gravel. The tank continued to slide off the turn pad and down a steep shoulder. The combination of the lateral momentum and the angle of the slope at the bottom of the shoulder catapulted the vehicle into a violent roll. This 70-ton vehicle turned completely over and came to rest in an upright position, fatally injuring the TC.

The combination of the lateral momentum and the angle of the slope at the bottom of the shoulder catapulted the vehicle into a violent roll. This 70-ton vehicle turned completely over and came to rest in an upright position, fatally injuring the TC.

What went wrong?

Both the TC and driver were overconfident. Although the driver had maneuvered through this turn several times before, the rate of speed was too great for the conditions. There was no time requirement or extreme urgency to reach BP1. The Range Safety NCO had specifically briefed the 20 mph speed limitation during his safety briefing; however the TC didn't listen. The TC was quite experienced and should have realized the danger; however, he failed to communicate with the driver to slow the vehicle down—and the result was fatal.

Lessons learned

Once again, human error became a contributing factor in the loss of a soldier. Leaders must ensure that they and their crewmembers are positioned correctly in their vehicles and are taking advantage of all safety features. The nametag defilade position increases your ability to lower yourself safely inside the vehicle and prevents excessive exposure of body parts to the elements outside. Seatbelts (if provided), guards, clothing, and securing equipment enhance your survivability if your vehicle should happen to invert or strike a solid object.

Operators need to be

trained on and constantly reminded of the operating ability of their tanks on slopes, curves and different soil conditions. TM 9-2350-264-10-1, *Operator's Manual*, page 1-16 (Performance Data), limits the maximum side slope as 40 percent or 22 degrees. While the shoulders of this road were within the identified limits for forward movement, there was little room for error.

Drivers need to know and maintain correct speeds and slow down on hard surfaces when attempting a turn. Although the turn pad was not a direct cause, it did play a major part in the accident. TM 9-2350-264-10-1, dated September 1990, page 2-154, states, "Avoid speeds greater than 32 km/h (20 mph) when making sharp turns. Tank skidding on soft ground, sand, or gravel can cause the tank to throw track." The scattered gravel on the turn pad acted like a handful of ball bearings, and the tank lost traction, leaving the driver unable to control the vehicle. The tank track in this case stayed intact; however, at that speed, it did skid. A solid driver's training program and active supervisor involvement will ensure a smooth running, incident-free mission.

Summary

Leaders are responsible for the actions of their crewmembers. The senior person is in charge and must take charge. Tasked with the responsibility of safe conduct and operation, the TC did not take control of the situation. The TC allowed the driver to accelerate beyond a safe handling speed due to his overconfidence in the driver's ability. The result was permanent and preventable. The cost? A young soldier's life.

POC: Ground Systems and Accident Investigation Division, DSN 558-3562 (334-255-3562)

MESSAGE UPDATE

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SUBJECT: Army Accident Reporting and Records

A. AR 385-40, *Accident Reporting and Records*, 1 November 1994.

B. DODI 6055.7, *Accident Investigation, Reporting, and Record Keeping*, 3 October 2000.

1. Reference A provides Army policy and procedures on Army accident classification, notification, investigation, reporting, record keeping, and implements related DOD requirements.

2. Reference B recently revised DOD accident investigation, reporting, and record keeping requirements. A revision of AR 385-40 will be coordinated and published IAW Army publications procedures. Until publication of the revised AR 385-40, requirements in Reference A remain applicable Armywide.

3. The following clarifies the AR 385-40 requirement that all training-related deaths be investigated.

a. Training-related deaths are deaths associated with a non-combat military exercise or training activity that is designed to develop a military member's physical ability or to maintain or increase individual/collective combat and/or peacekeeping skills, and occurs during or within one hour after such training activity.

b. Training-related deaths occurring during or within one hour after any training activity will immediately be reported to USASC Operations, DSN 558-2660/3410 (334 255-2660/3410). {Ref. Para 3-2}

c. If the training-related death is not selected by the Director of Army Safety for central accident investigation, a MACOM or installation-level investigation will be conducted to determine cause of accident and identify controls that if applied would reduce the risk of further accidents or deaths. {Ref. Para 1-4b}

d. Training-related deaths determined to result from natural causes will not be classified by USASC as Class A Army accidents. Training-related deaths determined to be Army accidents will be classified by USASC as Class A Army accidents. {Ref. Para 2-7i}

4. Point of contact is Fran Weaver, USASC Safety Occupational Health Manager, Policy and Programs Division, DSN 558-1141 (334-255-1141), weaverf@safetycenter.army.mil.